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GIFFORD PINCHOT, Forester.

EXTENT AND IMPORTANCE OF THE WHITE PINE BLIGHT.

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Early in the summer of 1907 the Forest Service began to receive inquiries from various parts of New England regarding a peculiar blight of the white pine in that section. These inquiries became more numerous as the season advanced, and it was evident that the trouble was widespread and in some localities threatened to develop into serious proportions. As a result, the Forest Service started an investigation, in cooperation with the Laboratory of Forest Pathology, Bureau of Plant Industry, which had had the blight under observation since July, 1905. This circular is intended to outline the distribution of the blight, as now known, together with its effects, and to point out ways in which every one can help in studying it. It is simply a popular account of the disease, and no attempt is made to consider symptoms that are not apparent to the naked eye. The exact cause and nature of the disease are not as yet definitely known, and until the investigation is further advanced it would, of course, be premature to suggest a remedy. Sample plots have been established at Brunswick, Me., and at Peterboro, N. H., as well as at several other places, for the study of the disease, and will doubtless yield much valuable information in regard to it.

THE DISEASE.

Trees affected by the blight may be readily recognized from the characteristic reddish-brown color assumed by the newest needles. The tip of the needle is always affected first, and needles with the base or middle turned brown, but with the tip green, are practically never seen. The extent of the discoloration varies greatly in different needles and in different trees; sometimes only the tip is affected, sometimes the whole needle. Attacked trees look as if they had been scorched by fire, or as if the tips of the needles had been dipped into a reddish-brown dye.

The needles of the white pine fall after two years, so that the foliage consists of two sets of needles. In most cases only the newer needles are affected, while those of the previous year remain perfectly green and normal. When the older needles are, as occasionally happens, dried up and withered, this is apparently due to blight during their first year. In such cases the newer needles are usually stunted, bunched up, and undeveloped, and are nearly always blighted. A tree which is attacked one year appears rarely to escape the next.

Trees of all ages and sizes, whether growing in the open or in closed stands, seem to be almost equally affected, with two apparent exceptions: (1) Large, full-crowned trees with a diameter of 18 inches or more, standing in the open, seem to be very rarely affected; and (2) trees in the interior of a dense stand seem to be more rarely affected than those near the edge. Otherwise the blight seems indifferent to the health or to the situation of the tree and to the character or moisture of the soil in which the tree is growing.

As a rule, only isolated and scattering trees are attacked, and neighboring trees do not seem to be affected by contact. This scattered occurrence of affected trees usually makes the disease less conspicuous and therefore less easy to detect.

Whether affected trees ever recover or not is still unsettled. Many trees have died in two years. Others seem to drag along for several years, showing the blight each year, but without succumbing. Others, again, have died within a few months, and still others seem to be recovering. Consequently, no set rule can be laid down as to the progress of the disease. Dead trees are apparently attacked by borers and other wood-destroying insects very quickly, and should therefore be utilized as soon as possible.

Since cold weather set in last fall there has been no observed change in the blight; the affected trees have grown neither better nor worse. The disease is, however, less conspicuous now than it was last summer, partly because the healthy needles are a duller green in winter than during the rest of the year and so contrast less sharply with the brown, blighted needles, and partly because the

strong fall and winter winds have in many cases broken off the brown tips of many of the blighted needles and so reduced the extent of the discoloration. Careful observation leads to the conclusion that the disease has been practically stationary during cold weather, as was to be expected, whatever the cause of the trouble. With the coming of spring, changes undoubtedly take place and new developments may be looked for which should yield valuable information.

DISTRIBUTION OF THE BLIGHT.

The disease seems to have been first noticed and recognized as being a distinct trouble of the white pine about four or five years ago, at Concord, N. H., although there are reports of the occurrence of such a trouble in previous years. At that time only a very few trees were affected. In the summer of 1905 the disease was reported from Concord, N. H., and from Brunswick, Me., but was then not widespread and was not very serious where it did occur. The next year, 1906, there was little change; only a few scattering trees were attacked, just as in the previous year.

In the spring of 1907, however, the disease suddenly appeared throughout the greater part of New England and in localities which had hitherto been untouched. It is now known to occur throughout nearly all of New England south of the White Mountains, and also in New York, New Jersey, and Pennsylvania.

In the accompanying map each circle represents an affected locality, and the distribution of the blight as at present ascertained may be seen at a glance. Undoubtedly this record of its distribution is incomplete, and it is extremely desirable to extend it so as to include the whole range of the blight. Every one who knows of other places where it occurs can therefore give material help by communicating with the Forest Service.

In New England, as would naturally be expected, the blight occurs most abundantly in the white pine belt—that is, in southwestern Maine, southern New Hampshire, and northern Massachusetts. It also occurs in the other three New England States, but not to nearly so great an extent.

In Maine the worst damage is found at Brunswick and in the extreme southwestern corner of the State, near Eliot and York, where from 5 to 10 per cent and even more of the trees are affected over limited areas. Some of the trees are already dead and many others are much browned, so that the trouble is very noticeable and some beautiful old groves have been badly blighted. West of here, in the western part of Cumberland County, the blight is not very extensive, and in general there is but little of it throughout the western part of the State. At Rumford Falls, in Oxford County, there is a considerable patch, and this is as far north as the blight extends in that section of the State. In the central part of the State it reaches as far north as Skowhegan and Bangor, but decreases in severity the farther north one goes. At Bar Harbor, on Mount Desert Island, there are a few cases, and this seems to be its eastern limit so far. Not a great amount of pine is left north of Bangor, and this seems to be unaffected.

In New Hampshire the blight occurs throughout the State south of the White Mountains. The most northern records of its occurrence are at Conway, in Carroll County, and at Bath, in Grafton County, with an apparently isolated but rather severe outbreak at Lake Umbagog, in Coos County. It is in the southern part of the State, however, that the disease is most prevalent. In the northern part white pine is rather scarce, but the southern part is true white pine country, and the pine is abundant and is in many cases creeping back and taking possession of abandoned fields and pastures. It is therefore only natural that this section should suffer most. The vicinity of Nashua is perhaps the most severely affected, but there is a good deal of damage throughout this region, as at Peterboro, Newport, and West Lebanon.

The disease is found to some extent in Vermont, and has been reported as far north as Burlington. In general, however, there is very little of it in the State, since the comparative scarcity of white pine offers the blight a slighter foothold.

In Massachusetts the trouble extends throughout the whole State. It is worst, however, in the north central part. Near Greenfield, Petersham, Dana, and Athol are a number of badly affected areas in the midst of large stands of valuable pine. South of the central line of the State the trouble decreases gradually, but in the southeastern part it again appears quite conspicuously near Marion, at the head of Buzzards Bay.

The blight is found in both Rhode Island and Connecticut, but it is not very common or very serious, because there is not a large quantity of pine in these States.

Maine, southern New Hampshire, and northern Massachusetts. Its local distribution within this territory is very irregular. Certain towns are severely attacked, while neighboring towns with fully as much pine are untouched. In general, it decreases toward the north more rapidly than the pine decreases, until in the northern part of Maine, New Hampshire, and Vermont there is scarcely a trace of it, even where there is more or less pine.

ECONOMIC ASPECTS.

From a commercial standpoint the damage so far caused by the blight is not very great. Whole stands have in no case been destroyed, and throughout most of the region only scattering trees are affected. The number of trees that have been killed is relatively small and the money loss slight. If, however, all of the trees now affected should die the total loss would be considerable. This loss would include not only the actual stumpage value of the trees for lumber but also their value as ornamental and pleasure groves. Two of the worst infected patches in New England occur at Brunswick and Eliot, Me., where this loss would be most severely felt. At Brunswick the pines are in a fine old grove owned by Bowdoin College, which is inseparably interwoven with the traditions and history of the college; and at Eliot they form one of the chief charms of the Greenacre Conference Grounds, to which hundreds of vacationists and health seekers go every year.

Considerable young growth has already been killed, and the damage to this is perhaps fully as important as that to the mature trees. Yet, on the whole, the actual loss so far is not great, and the disease has not proved serious enough to warrant general alarm. If, however, it continues to increase as fast as it has in the last year the situation will certainly be very serious. There are so many centers from which it could spread that an infectious disease might very readily develop into a serious epidemic. In such an event the loss of the young growth would be fully as serious as that of the mature trees, since the lumber in the older growth could be utilized, while the young trees would be a total loss.

Whether or not the blight will eventually have any permanent effect on the white pine can not be foretold at present. Its high commercial value, rapidity of growth, sureness of production, hardiness, and freedom from injury have all combined to make it the most popular and valuable tree of the New England States. As a result, existing stands have been protected, young growth has been encouraged, and planting has been practiced to a greater extent than with any other species in this region. Further developments alone can show whether the blight is to have any influence in lowering this high standing of the pine and in decreasing its value. At present there is not enough evidence at hand for drawing safe conclusions.

SUMMARY.

The white pine blight first made its appearance four or five years ago, but attracted little attention until the summer of 1907, when an extensive and rather serious outbreak occurred. It is now widely distributed throughout central and southern New England and reaches into New York, New Jersey, and Pennsylvania. So far the disease has done but little damage, but it has now obtained such a foothold that if it proves to be infectious it may have serious results. The cause of the trouble is still unknown. The situation is not one which calls for alarm, but simply for watchfulness and further investigation. What is needed is definite information in regard to all points connected with it. Every one is therefore urged to send to the Government all the information he may have concerning it, together with specimens of affected twigs, which should be sent to the Laboratory of Forest Pathology, Bureau of Plant Industry, Department of Agriculture. It is particularly desired to learn as much as possible about its distribution and its appearance and development during the coming season. Such information will help greatly in determining what the trouble is and the best methods of dealing with it.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., April 18, 1908.